CLAIMS

1. A metal reactor cell for the treatment of gases comprising overlapping corrugated sheets (2, 3, 12, 13) which can have been formed for instance from a sheet strip by winding, folding, or cutting and stacking, said reactor cell (1,11) optionally comprising other sheets (4, 6) such as flat sheets, perforated sheets, mesh sheets and/or other corrugated sheets, **characterized** in that said reactor cell (1, 11, 41) has a housing (7, 47) and overlapping sheets (2, 3, 4, 6, 12, 13) are joined to each other so that there are channels (9, 19) between them and said overlapping sheets (2, 3, 12, 13) are joined together at the corrugations (31, 32, 33) of said overlapping sheets (2, 3, 12, 13) with joints (5, 15) that are located at least at some corrugations (31, 32, 33) of each corrugated sheet (2, 3, 12, 13) and spaced apart by intervals of 0.5 to 10 mm, the number of said joints (5, 15) between each overlapping corrugated sheets (2, 3, 12, 13) being 10 to 1000 per cm3.

2. The reactor cell according to claim 1, **characterized** in that other sheets (4, 6) are joined together (4, 6) and/or to overlapping corrugated sheets (2, 3, 12, 13) by joints (5, 15) so that the number of said joints (5, 15) between each overlapping sheets (2, 3, 4, 6, 12, 13) being 10 to 1000 per cm3.

3. The reactor cell according to claim 1, **characterized** in that said corrugated sheet (2, 3, 6, 12, 13) is a profiled sheet, such as a corrugated sheet (2, 3) or a sheet having V-shaped profiles (6, 12, 13).

4. The reactor cell according to claim 1, **characterized** in that said cell comprises overlapping corrugated sheets (2, 3, 12, 13), having corrugations (31, 32, 33) at an angle of 10 to 60 degrees relative to each other. 8. The reactor cell according to any of the above claims, **characterized** in that said reactor cell (1a) is combined with another reactor cell (1b), said sheets (2a, 2b) of said reactor cells (1a, 1b) being oriented in different directions relative to each other.

5. The reactor cell according to claim 1, **characterized** in that said reactor cell (51, 52) comprises a conical section, said reactor cell (51, 52) being inserted into a housing (57) having a conical section substantially conforming to the conical section of the reactor cell (51, 52).

6. A metal reactor cell for the treatment of gases comprising overlapping corrugated sheets (2, 3, 12, 13) which can have been formed for instance from a sheet strip by winding, folding, or cutting and stacking, said reactor cell (1,11) optionally comprising other sheets (4, 6) such as flat sheets, perforated sheets, mesh sheets and/or other corrugated sheets, **characterized** in that said reactor cell (1, 11, 41) has a housing (7, 47) and overlapping sheets (2, 3, 4, 6, 12, 13) are joined to each other so that there are channels (9, 19) between them, and a sheet (42) of the reaction cell (41) is joined to the housing (47) by one or several connecting grooves (43, 44, 45) on the surface of the housing, which connecting groove (43, 44, 45) is such that when making it said connecting groove has orientated a sheet (42) of the reactor cell (41) parallel to the inside of the housing (7, 47), and said sheet (42) is also connected to the housing (7, 47) with one or several weld joints (46) made on the bottom of the connecting groove (43, 44, 45) through the housing (7, 47).

7. The reactor cell according to claim 6, **characterized** in that other sheets (4, 6) are joined together (4, 6) and/or to overlapping corrugated sheets (2, 3, 12, 13) by joints (5, 15) so that the number of said joints (5, 15) between each overlapping sheets (2, 3, 4, 6, 12, 13) is 10 to 1000 per cm3.

8. The reactor cell according to claim 6, **characterized** in that said corrugated sheet (2, 3, 6, 12, 13) is a profiled sheet, such as a corrugated sheet (2, 3) or a sheet having V-shaped profiles (6, 12, 13).

9. The reactor cell according to claim 6, **characterized** in that said cell comprises overlapping corrugated sheets (2, 3, 12, 13), having corrugations (31, 32, 33) at an angle of 10 to 60 degrees relative to each other.

10. The reactor cell according to claim 6, **characterized** in that said reactor cell (1a) is combined with another reactor cell (1b), said sheets (2a, 2b) of said reactor cells (1a, 1b) being oriented in different directions relative to each other.

11. The reactor cell according to claim 6, **characterized** in that said connecting groove (43, 44, 45) comprises one or several welded joints (46).

12. The reactor cell according to claim 6, **characterized** in that the depth and/or height of said connecting groove (43, 44, 45) is 0.5 to 2.0 mm.

13. The reactor cell according to claim 6, **characterized** in that said reactor cell (51, 52) comprises a conical section, said reactor cell (51, 52) being inserted into a housing (57) having a conical section substantially conforming to the conical section of the reactor cell (51, 52).

14. A metal reactor cell for the treatment of gases comprising overlapping corrugated sheets (2, 3, 12, 13) which can have been formed for instance from a sheet strip by winding, folding, or cutting and stacking, said reactor cell (1,11) optionally comprising other sheets (4, 6) such as flat sheets, perforated sheets, mesh sheets and/or other corrugated sheets, **characterized** in that said reactor cell (1, 11, 41) has a housing (7, 47) and overlapping sheets (2, 3, 4, 6, 12, 13) are joined to each other so that there are channels (9, 19) between them, and the sheets (2, 3, 4, 6, 12, 13) have been preoxidized and after preoxidation they have been joined by joints (5, 15) made by resistance welding to each other/to sheets (2, 3, 4, 6, 12, 13), to the housing (7, 47) and/or to a part of the housing.

15. The reactor cell according to claim 14, **characterized** in that other sheets (4, 6) are joined together (4, 6) and/or to overlapping corrugated sheets (2, 3, 12, 13) by joints (5, 15) so that the number of said joints (5, 15) between each overlapping sheets (2, 3, 4, 6, 12, 13) is 10 to 1000 per cm3.

16. The reactor cell according to claim 14, **characterized** in that said corrugated sheet (2, 3, 6, 12, 13) is a profiled sheet, such as a corrugated sheet (2, 3) or a sheet having V-shaped profiles (6, 12, 13).

17. The reactor cell according to claim 14, **characterized** in that said cell comprises overlapping corrugated sheets (2, 3, 12, 13), having corrugations (31, 32, 33) at an angle of 10 to 60 degrees relative to each other.

18. The reactor cell according to claim 14, **characterized** in that said reactor cell (1a) is combined with another reactor cell (1b), said sheets (2a, 2b) of said reactor cells (1a, 1b) being oriented in different directions relative to each other.

19. The reactor cell according to claim 14, **characterized** in that said reactor cell (51, 52) comprises a conical section, said reactor cell (51, 52) being inserted into a housing (57) having a conical section substantially conforming to the conical section of the reactor cell (51, 52).

20. A metal reactor cell for the treatment of gases comprising overlapping corrugated sheets (2, 3, 12, 13) which can have been formed for instance from a sheet strip by winding,

folding, or cutting and stacking, said reactor cell (1,11) optionally comprising other sheets (4, 6) such as flat sheets, perforated sheets, mesh sheets and/or other corrugated sheets, **characterized** in that said reactor cell (1, 11, 41) has a housing (7, 47) overlapping sheets (2, 3, 4, 6, 12, 13) are being joined to each other so that there are channels (9, 19) between them and said overlapping corrugated sheets (2, 3, 12, 13) are joined together at the corrugations (31, 32, 33) of said overlapping corrugated sheets (2, 3, 12, 13) with joints (5, 15) that are located at least at some corrugations (31, 32, 33) of each corrugated sheet (2, 3, 12, 13) and spaced apart by intervals of 0.5 to 10 mm, the number of said joints (5, 15) between each overlapping corrugated sheets (2, 3, 12, 13) being 10 to 1000 per cm3 and in the reactor cell (1, 11 overlapping sheets (2, 3, 4, 6, 12, 13) are joined to each other so that there are channels (9, 19) between them, and the sheets (2, 3, 4, 6, 12, 13) are being preoxidized and after preoxidation they are being joined together in the joinings (31, 32, 33) of the sheets (2, 3, 4, 6, 12, 13) by joints (5, 15) made by resistance welding and/or sheets (2, 3, 4, 6, 12, 13) are joined to the housing (7, 47) and/or to a part of the housing by joints (5, 8, 10, 15) made by resistance welding.

21. A method according to claim 20, **characterized** in that said reactor cell (1, 11) overlapping corrugated sheets (2, 3, 12, 13) are being joined to each other so that there are channels (9, 19) between them and the sheets (2, 3, 4, 6, 12, 13) have been preoxidized and after preoxidation they have been joined together by joints (5, 15) at the joinings (31, 32, 33) made by resistance welding and/or sheets (2, 3, 4, 6, 12, 13) have been joined to the housing (7, 47) and/or to a part of the housing by joints (5, 8, 10, 15) made by resistance welding.

21. A method for manufacturing a metal reactor cell (1, 11) comprising overlapping corrugated sheets (2, 3, 12, 13) which can have been formed for instance from a sheet strip by winding, folding, or cutting and stacking, said reactor cell (1, 11) optionally comprising other sheets (4, 6) such as flat sheets, perforated sheets, mesh sheets and/or other corrugated sheets, **characterized** in that said reactor cell (1, 11, 41) has a housing (7, 47) and overlapping sheets (2, 3, 4, 6, 12, 13) are joined to each other so that there are channels (9, 19) between them and the corrugated sheet (2, 3, 6, 12, 13) is joined to the overlapping sheet (2, 3, 4, 6, 12, 13) at the corrugations (31, 32, 33) by joints (5, 15) made by resistance welding so that at at least some corrugations (31, 32, 33) of each corrugated sheet (2, 3, 6, 12, 13) there are joints spaced apart by intervals of 0.5 to 5 mm and/or 1 – 5 mm, and the number of said joints (5, 15) between each overlapping corrugated sheets (2, 3, 4, 6, 12, 13) is 10 to 1000 per cm3.

22. A method for manufacturing a metal reactor cell (1, 11) comprising overlapping corrugated sheets (2, 3, 12, 13) which can have been formed for instance from a sheet strip

by winding, folding, or cutting and stacking, said reactor cell (1, 11) optionally comprising other sheets (4, 6) such as flat sheets, perforated sheets, mesh sheets and/or other corrugated sheets, **characterized** in that said reactor cell (1, 11, 41) has a housing (7, 47) and overlapping sheets (2, 3, 4, 6, 12, 13) are joined to each other so that there are channels (9, 19) between them and a sheet (42) of the reaction cell (1, 41) is joined to the housing (7, 47) by one or several connecting grooves (43, 44, 45) on the surface of the housing (7, 47), which is such that when making the connecting groove (43, 44, 45) said connecting groove will orientate a sheet (42) of the reactor cell (41) parallel to the inside of the housing, and said sheet (42) is also connected to the housing (7, 47) with one or several weld joints (46) made on the bottom of the connecting groove (43, 44, 45) through the housing (7, 47).

23. A method for manufacturing a metal reactor (1, 11) comprising overlapping corrugated sheets (2, 3, 12, 13) which can have been formed for instance from a sheet strip by winding, folding, or cutting and stacking, said reactor cell (1, 11) optionally comprising other sheets (4, 6) such as flat sheets, perforated sheets, mesh sheets and/or other corrugated sheets, **characterized** in that said reactor cell (1, 11, 41) has a housing (7, 47) overlapping sheets (2, 3, 4, 6, 12, 13) are being joined to each other so that there are channels (9, 19) between them, and the sheets (2, 3, 4, 6, 12, 13) are being preoxidized and after preoxidation they are being joined together in the joinings (31, 32, 33) of the sheets (2, 3, 4, 6, 12, 13) by joints (5, 15) made by resistance welding and/or sheets (2, 3, 4, 6, 12, 13) have been joined by joints (5, 8, 10, 15) made by resistance welding to the housing (7, 47) and/or to a part of the housing.

24. A method for manufacturing a metal cell, **characterized** in that said reactor cell is manufactured according to claims 21 – 23.

25. The use of the reactor cell according to claims 1 – 20 or manufactured according to claims 21 - 24, **characterized** in that said reactor cell (1, 41, 51, 52) is used to purify combustion gases such as exhaust gases or flue gases.